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ABSTRACT

The Augmented Staffing model of the Chicago Public Schools (Illinois) is a reduced class size, full-day program that includes almost 6,500 elementary school students served under Chapter 1 of the Elementary and Secondary Education Act (ESEA). The effects of this program were studied, examining the level of teacher knowledge about the program and its implementation, the achievement of the program's students, and program characteristics. Data are from the school system's overall report on Chapter 1 programs, which incorporated 660 observations, and questionnaires completed by 192 teachers in 1990, 441 in 1991, 99 in 1992, and 164 in 1993. Results suggest that reduced class size in itself is not sufficient to improve student test scores, but that achievement levels can rise when teachers employ more techniques associated with higher order thinking skills even though teachers relieved of the pressure of large classes do have an opportunity to diagnose their students' needs more carefully. Three tables present study data. (Contains 11 references.) (SLD)

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Reduced Class Size in ESEA Chapter 1: Unrealized Potential?

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Paper to be given at the annual meeting of the American Educational Research Association, New Orleans, LA, April 4-8, 1994.

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Abstract

Augmented Staffing is a reduced class size, full day program which includes almost 6,500 ESEA Chapter 1 elementary students in the Chicago Public Schools. Teachers' knowledge of program requirements, goals, inservice training, implementation factors such as facilities, materials, aides, instructional characteristics, are discussed for their impact on test results over three years. The paper concludes that reduced class size is insufficient in itself to improve students' test score gains. Yet, when teachers employ more techniques associated with higher order thinking skills, achievement levels can rise. Additional inservice training in teaching advanced skills is advocated.

Reduced Class Size in ESEA Chapter 1: Unrealized Potential?

Introduction

The purpose of this paper is to indicate how a reduced class size full-day program in elementary schools may enhance learning opportunities for educationally needy students in poverty areas. Problems and weaknesses of the program and possibilities for improvements will be discussed.

Chapter 1 of the Elementary and Secondary Education Act (ESEA) is the primary vehicle providing supplementary resources to help poor children in nearly all school districts in the United States. With Congressional reauthorization looming, and committee decisions on policy coming out weekly, it is worthwhile to reexamine the instructional patterns that have become institutionalized in one large school system (the Chicago Public Schools) to provide this assistance.

Recent Commentary on Reduced Class Size

The effects of class size on student outcomes have been studied and reported extensively. In the lower grades particularly, Mueller, Chase, and Walden (1988) reported multiple advantages when there were no more than 18-22 students in a class: less hectic atmosphere, better teacher morale, more individualized instruction, and improved achievement for at-risk students. In multiyear studies in Tennessee on the effects of small class size, Nye et al. (1992) found that students who were placed in smaller classes as part of the STAR (Student-Teacher Achievement Ratio) project in the early grades also "gained in reading and mathematics levels."

Slavin (1990) accepts the premise that reduced class size "may improve school tone and morale," but he concludes that "it is not an adequate policy alone for significantly accelerating student achievement." Heather Harder (1990), too, is sceptical about the claims of substantial benefits from smaller classes. She states that "quality of instruction may be more important than class size." Odden (1990) adds that "ambitious staff development programs" are also needed.

A report of the U. S. Department of Education has called reduced class size "the most costly and most primitive" method of enhancing student achievement. Still, as Schultz (1989) reports, the document noted that significant improvement in achievement could be expected when class size drops to no more than 15 students.

Focus on Augmented Staffing

My focus is on a reduced class size option listed in annual guidelines for Chapter 1 programs in the Chicago Public Schools and approved by the Illinois State Board of Education. In the Augmented Staffing model, the responsibility for a regular size classroom group of 32-33 Chapter 1 students is divided between two teachers, one Board-funded and the other funded by Chapter 1. They may be in separate or shared classrooms, and the teachers are often assisted by an aide. Elementary students in Augmented Staffing classes receive their basic instruction in all subject areas as they remain with these teachers for the whole day. Augmented Staffing students may also participate in pullout programs. (In the pullout instructional approach, Chapter 1 students go to another location for a period of Chapter 1 instruction, usually computer-driven.)

Research Questions -- The Problem

This paper addresses the following questions:

Are Augmented Staffing teachers sufficiently knowledgeable about their program and about Chapter 1?

Do Augmented Staffing teachers know how to maximize student learning in their specialized setting?

How does achievement in the Augmented Staffing program compare to the outcomes expected for ESEA Chapter 1 students and schools?

Which of the program characteristics can be identified as strengths or as weaknesses?

What are the policy implications of the data?

Date Sources

The main data sources for this paper are reports of the overall Chapter 1 program in the Chicago schools from FY93, FY92, FY91, and FY90. These documents summarize the results of four years of observations, teacher questionnaires, student enrollment forms, and standardized test scores.

A third of the Chapter 1 elementary schools was selected for observation in each of the years under consideration. Observers visited a random sample of classrooms once or twice a year, spending 30-40 minutes in the room each time. Summaries of observations in Augmented Staffing classes were available in the annual evaluation reports from each year. Observations numbered 206 in FY90; 180 in FY91; 109 in FY92; and 165 in FY93.

Questionnaires collected each spring from Augmented Staffing

teachers numbered 192 in FY90; 441 in FY91; 99 in FY92; and 164 in FY93.

On enrollment forms, also collected each spring, teachers reported individual student program participation, attendance, and report card grades.

Findings

Knowledge about the Augmented Staffing Program

The Augmented Staffing teachers queried know how their students were selected for the program--mainly on the basis of low test scores, although teacher recommendations were also frequently mentioned. According to the teachers who responded in 1993, they are more likely to have helped select their students than in past years. In addition, more of these teachers indicated they were familiar with the program design than before. Still, as Table 1 indicates, the Augmented Staffing teachers were less involved with planning their program than the pullout teachers.

Most (84 percent of 164) of the Augmented Staffing teachers stated on questionnaires last spring that they had attended Chapter 1-related inservice training. But the topics they reported most often differed sharply from those of the pullout teachers. The Augmented Staffing teachers reported more training in attendance improvement, classroom management, multiculturalism, and fine arts; and less training in instructional strategies, parent involvement, and problem solving. Yet the pullout teachers said they wanted even more training in these latter areas. It appears that the Augmented Staffing teachers are getting less training in basic instructional practices compared to the pullout teachers.

Characteristics of the Augmented Staffing Classroom

Class size. It is hard to distinguish Augmented Staffing classes from regular rooms on characteristics besides smaller class size. In FY93, the median enrollment in observed Augmented Staffing classes was 15 students and median attendance, 12-13 (80-86 percent), although teachers reported, on individual student enrollment forms, an average attendance of 91.5. The classes were slightly larger, on average, than Chapter 1 pullouts.

Materials. Teacher ratings of how well their materials met students' needs have gone up each year since 1990, reaching 3.4 in FY93 on a four-point scale. Delivery of materials, too, according to teachers, has improved over four years (see Table 1).

Aides. Instructional aides were present in 28 percent of the observed Augmented Staffing classes, and their activities have been about the same each year: working with individual students, monitoring, and performing clerical tasks. Although Nye (1993)

could not detect any effect from the presence of aides in reduced class size settings, most of our teachers say that they are satisfied with the services of their aides.

Instruction. In FY93, reading lessons took place in 48 percent of the observations, language arts lessons in 39 percent of the observations, and lessons in math and a few other subjects in 13 percent of the observations. Teacher-directed question-and-answer formats were noted more than 40 percent of the time. Instructional strategies used by the teacher in at least a quarter of the observed rooms in FY93 were modeling and demonstrating academic behaviors, explaining lesson content in own words, probing students' responses, and involving students in the lesson (see Table 2).

The guidelines stated in the annual application for Chapter 1 funding call for "flexible groups, varied learning activities, and a curriculum based on the assessed needs and interests of each participating pupil." Augmented Staffing's smaller class should allow the teacher to give more individual attention to students, and in FY93, observers did note more individual and partial group activities than in the past (in 61 percent of the observations compared to 38 percent in FY91). Yet, in FY93, Augmented Staffing teachers spent less time with small groups or individuals than was reported for six types of pullout programs that year.

Shared facilities. Other aspects of the Augmented Staffing setting are also troubling. About 14 percent of these classes share a room. The classes may be separated by actual or implied dividers, or, in some cases, are organized for team teaching. While principals often say they have selected Augmented Staffing as a means of relieving overcrowding, the negative consequences of this sharing are evident in instruction. It was reported in FY91 that teachers in the shared rooms much less often used the strategies associated in the research literature with advanced thinking skills compared to other Augmented Staffing teachers who did not have the competition of a second teacher's presence.

Noise, too, can be a problem. Even though observers reported relatively few instances of noise (less than 5 percent of observations in all elementary Chapter 1 programs), noise was cited in 22 percent of the Augmented Staffing classes in shared spaces.

Augmented Staffing Achievement Compared to Desired Outcomes

The federal government has not mandated Augmented Staffing or any other instructional approach as the best model for Chapter 1 children. Rather, it has set a goal for each school to show a positive aggregate gain in Chapter 1 student performance. This "desired outcome" is defined as a positive normal curve equivalent (NCE) gain (i.e., more than zero) from pretest to posttest. The standardized test scores of all Chapter 1 students in a school, in

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Augmented Staffing or other Chapter 1 basic instructional programs, are combined to arrive at the aggregate. The Illinois State Board of Education has added two other goals: that 75 percent of the Chapter 1 students in a school will gain, and that two thirds of the grades with Chapter 1 students will show a gain. Schools that fail to meet these goals in Illinois must file Program Improvement Plans which state how they will alter their current Chapter 1 programs to make attainment of the goals more likely.

Augmented Staffing students' scores on the Iowa Tests of Basic Skills (ITBS), administered each spring, were compared to those of other Chapter 1 instructional approaches, to the overall Chapter 1 results, and to the federal and state goals for improvement.

Table 3 displays three years of paired Augmented Staffing and overall Chapter 1 means and percentages of gains. The data may be summarized as follows:

. By 1993, the Augmented Staffing means and percentages of gains in Reading, Computation, and Math Problem Solving were all higher than the previous two years. This is an encouraging trend, though a longer than usual period between pretest and 1993 posttest probably inflated the results.

. In 1993, a higher percentage of Augmented Staffing students made gains in reading (57 percent) than in math (50-52 percent).

. In 1993, in Reading and Math Problem Solving, the Augmented Staffing mean posttests, 26 and 28 NCEs, respectively, are mid-third stanine, indicating that most of these students have not yet moved up and out of the Chapter 1-eligible category.

. In 1993 in Computation, the Augmented Staffing posttest mean, 34 NCEs, is the borderline between the third and fourth stanine. Traditionally, Chicago Chapter 1 students overall have done better in computation than the other subjects.

. In all but two of the comparison pairs in the achievement table across years, the Augmented Staffing result is lower than overall Chapter 1.

. The 1993 gap in Reading and Math Problem Solving means between Augmented Staffing and overall Chapter 1 was more than 2 NCEs.

. The 1993 gap in Computation means between Augmented Staffing and overall Chapter 1 was less than 2 NCEs.

The percentage of Augmented Staffing students (and Chapter 1 students overall) who made gains was distant from our state goal for 75 percent to improve.

The variation in program results by school was extreme. In FY93,

for example, the percent of students registering reading gains ranged from 91 percent in the highest school to only 22 percent in the lowest school. In FY92, the spread was even greater.

Strengths

In 1993, teachers listed more strengths of the program than weaknesses on questionnaires. They perceived the greatest benefits of the program to be small class size, the opportunity to individualize instruction, more materials and equipment than regular classes, students' improved self-esteem, and extra services such as art instruction. These opinions concur with published reports of the advantages of other reduced class size programs (e. g., Mueller, et al.).

Observers in FY93 gave "most positive" ratings to Augmented Staffing teachers as follows: discipline (classroom management), relationships with students, feedback, and expectations for student learning. On these items, Augmented Staffing positive ratings were equal to those of the higher rated pullout programs. Augmented Staffing was also ranked with the higher rated pullouts on lesson organization, lesson appropriateness, and student cooperation.

Weaknesses

Among the weaknesses cited by teachers in FY93 were lack of parent involvement, insufficient staff development, and little teacher input to the school Chapter 1 design or to selection of students. A review of the overall evaluation reports from the past four years shows a similar pattern of responses.

Observers rated Augmented Staffing classes lower than the pullout programs in the areas of adherence to guidelines and students' on-task behavior (significantly so in FY91).

Policy Implications of the Data

Just reducing class size will not automatically improve student learning. Smaller classes mean fewer discipline problems, as the data show. Yet observations bear out that many Augmented Staffing classes are conducted in the same way as if 33 students were there. Whole class grouping and silent seatwork often predominate. Techniques such as cooperative learning, that could work much more easily with fewer students present, are still not often observed.

Some persons know intuitively how to teach. They are the artists of the profession. But average teachers can learn to do better. Research has identified effective strategies and teachers can be trained in their use. The need for staff development must be made as explicit to Augmented Staffing teachers as to those in the pullout programs who quickly recognize the necessity of learning a vendor's computer program in order to teach it. Principals, too,

should realize that teachers newly placed in an Augmented Staffing room will need training to prepare them for the changed environment.

The results of another study of Chicago Chapter 1 students' classroom experiences suggest some ways that learning can be improved. The 1992 Chapter 1 summer school program can be thought of as another reduced class size program. It was similar to Augmented Staffing on the basis of a daily attendance of 18 students and having a teacher responsible for the entire curriculum. D'Agostino (1994) found that when teachers used more of the "authentic" instructional strategies which included higher order thinking skills, their students gained more than students who did not have those experiences. In addition, the level of gains made by the students receiving more authentic instruction was not significantly different from those of other Chapter 1 students who had not needed to go to summer school and did not attend. (The eight strategies asterisked in Tables 1 and 2 were among the 11 variables used to represent authentic instruction in this study.)

I conclude from this examination of several years of data on the Augmented Staffing program that reduced class size in itself is not sufficient as a strategy to improve Chapter 1 students' learning. Yes, teachers who are released from the pressures of a large class have a wonderful opportunity to diagnose their students' needs more carefully, instruct them as individuals, and monitor their progress. The program will continue to appeal to overcrowded schools that need extra personnel. Furthermore, inertia, school traditions, and doubts about the efficacy of pullout programs and other Chapter 1 alternatives make it likely that many schools will continue to choose the Augmented Staffing option. But, until the teachers receive more of the training they crave and adopt more of the recommended strategies, results will be short of the program's potential to improve achievement, currently the most desired Chapter 1 outcome.

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TABLE 1
Selected Characteristics of Augmented Staffing --
A Reduced Class Size ESEA Chapter 1 Program -- (Over Four Years)

	'93	'92	'91	'90
(From questionnaires)				
(On a scale of 1 to 4):	(N=164)	(N=99)	(N=441)	(N=192)
Augmented Staffing Teachers:	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$
Familiar with Chapter 1 program design	3.1	3.1	3.2	2.9
(Pullout teachers)	(3.5)	(3.5)	(3.5)	(3.4)
Involved in developing Chapter 1 design	2.8	2.3	2.4	2.2
(Pullout teachers)	(3.1)	(3.0)	(3.1)	(3.0)
Helped select students for Chapter 1	2.3	2.3	2.1	2.2
(Pullout teachers)	(3.6)	(3.6)	(3.6)	(3.2)
Materials met student needs	3.4	3.2	3.3	3.1
(Pullout teachers)	(3.5)	(3.5)	(3.6)	(3.4)
Deliveries timely	2.9	2.6	2.6	2.4
(Pullout teachers)	(3.2)	(3.0)	(2.9)	(2.7)
(From observations)	(N=165)	(N=101)	(N=180)	(N=206)
Augmented Staffing Teachers:	%	%	%	%
Began activities promptly	93	90	87	95
(All Chapter 1 observations)	(88)	(82)	(91)	
Had good rapport with students	62	82	84	84
(All Chapter 1 observations)	(59)	(87)	(91)	
* Expressed high expectations for learning	29	26	8	34
(All Chapter 1 observations)	(24)	(22)	(9)	
Lessons:				
Were consistent with guidelines	65	77	85	
(All Chapter 1 observations)	(66)	(85)	(88)	
Students:				
* Most were on task	71	81	75	77
(All Chapter 1 observations)	(74)	(87)	(81)	

*These strategies were found to be significantly related to class-level achievement gains.

Source: Teacher questionnaires and observations in Augmented Staffing classes, Chicago Public Schools.

TABLE 2
Instructional Strategies Used by Teachers in Augmented Staffing Classes

	'93 (N=123 obs.)		'92 (N=101 obs.)	
The Augmented Staffing teacher:	Reading %	Math %	Reading %	Math %
Involved students in lesson	38	9	29	9
Explained lesson content in own words	28	7	14	6
Modeled/demonstrated desired academic behaviors	26	7	18	9
* Probed student responses	24	5	18	5
Provided equitable response opportunities	24	4	26	3
* Introduced new concepts or vocabulary	23	-	26	-
Moved among students to provide information	22	11	20	13
Activated students' prior knowledge	21	7	26	16
Responded to students' questions	20	7	15	9
Employed several different teaching techniques	20	3	8	3
Set a purpose for the lesson	18	7	14	6
* Led students to think critically	17	1	5	1
Summarized and/or reviewed the lesson	16	2	15	5
Tailored instruction to individual needs	11	3	15	5
Guided students to ask appropriate questions	9	2	3	3
* Promoted cooperative learning	7	6	10	6
Guided students to exchange ideas and opinions	7	2	13	2
Led students to make predictions	7	1	11	-
* Promoted problem solving	5	4	5	6
Led students to verify, refine statements	5	1	5	2
* Led students to think creatively	2	-	3	-

*These strategies were found to be significantly related to class-level achievement gains.

Source: Observation reports from ESEA Chapter 1 Augmented Staffing classrooms, Chicago Public Schools.

TABLE 3
Achievement in Augmented Staffing and Overall ESEA Chapter 1 (A Three-Year Comparison)

	'93	'92	'91
Reading (NCE mean)	$\bar{x}$	$\bar{x}$	$\bar{x}$
Augmented Staffing	26.3	24.5	24.6
All Chapter 1	29.1	27.2	26.7
Reading (percent of students making gains)	%	%	%
Augmented Staffing	56.6	51.9	47.0
All Chapter 1	57.8	53.5	47.4
Reading (NCE mean gain)	$\bar{x}$	$\bar{x}$	$\bar{x}$
Augmented Staffing	3.1	1.3	-0.3
All Chapter 1	3.2	1.7	-0.3
Mathematics Problem Solving (NCE mean)	$\bar{x}$	$\bar{x}$	$\bar{x}$
Augmented Staffing	27.6	25.5	26.7
All Chapter 1	29.9	27.1	27.2
Mathematics Problem Solving (percent of students making gains)	%	%	%
Augmented Staffing	49.8	41.0	38.8
All Chapter 1	54.3	45.8	40.4
Mathematics Problem Solving (NCE mean gain)	$\bar{x}$	$\bar{x}$	$\bar{x}$
Augmented Staffing	-0.0	-2.9	-4.4
All Chapter 1	1.7	-1.1	-3.6
Computation (NCE mean)	$\bar{x}$	$\bar{x}$	$\bar{x}$
Augmented Staffing	34.1	33.2	33.6
All Chapter 1	35.8	34.4	34.5
Computation (percent of students making gains)	%	%	%
Augmented Staffing	51.5	47.1	49.2
All Chapter 1	52.5	48.2	49.3
Computation (NCE mean gain)	$\bar{x}$	$\bar{x}$	$\bar{x}$
Augmented Staffing	1.3	-0.7	0.4
All Chapter 1	1.6	-0.1	0.4

Source: *Iowa Tests of Basic Skills* results, administered Spring 1993, 1992, 1991, and 1990 in Chicago Public Schools.